SWENCH WRENCH
OPERATION
SERVICE AND MAINTENANCE
MANUAL

The Marquette METAL PRODUCTS CO.
a wholly owned subsidiary of
CURTISS-WRIGHT CORPORATION
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INDEX

Chapter I	General Information and Descriptive Data	4
Section 1	- General	4
Section 2	- Description and Characteristics	4
Chapter II	Operating Instructions	6
Section 1	- Service upon receipt of material	6
Section 2	- Controls	6
Section 3	- Operating Instructions	6
Chapter III	Maintenance, Disassembly, Repair & Assy. Instr.	9
Section 1	- Special Tools	9
Section 2	- Overhaul Procedure	9
Section 3	- Lubrication	9
Section 4	- Preventive Maintenance	9
Section 5	- Trouble Shooting Chart	9
Appendix I	- Lubrication Charts	
Appendix II	- Parts Lists	
Appendix III	- Overhaul Procedures	

CHAPTER I

GENERAL INFORMATION AND DESCRIPTIVE DATA

Section 1 - General

These instructions are published for the use of tool operating personnel. Included herein is complete information on operation, maintenance and repair as well as a description of all major parts and their functions in relation to other components of the SWENCH wrenches.

a. Appendix I contains lubrication charts.
b. Appendix II contains parts lists.
c. Appendix III contains disassembly, repair and reassembly instructions.

Section 2 - Description and Characteristics

The SWENCH wrench is a hand operated impact wrench requiring no outside source of power such as air or electricity.

a. Model differences

The basic differences between SWENCH models is in maximum torque output. There are a total of six models and the characteristics of each is shown by the chart below.

SWENCH MODEL		625	750	1000	1250	1500
Head radius in inches Dimension A (Fig. 1)		1-5/8"	2"	2-1/2"	3"	3-3/4"
Handle length in inches Dimension B (Fig. 1)		12"	16"	24"	36"	36"-60" with extension
Weight in lbs.		6"	11"	23"	46"	78"
Size of square drive inches		5/8"	3/4"	1"	1-1/4"	1-1/2"
Approx. bolt diameter capacity in inches	wide range of small bolt and nut sizes		1/2" to 1-1/4"	3/4" to 1-3/4"	3/4" to 2"	1-1/4" to 2-1/2"
Maximum torque on "frozen nuts" in ft. lbs.		500	800	2000	4500	7000
Maximum pull on handle		39	50	75	90	110 with handle extension

b. Principles of Operation

The SWENCH wrench operates in the following manner. Each time the handle is manually advanced slightly more than 30 degrees in a simple wrenching motion, it delivers a powerful torsional impact equal to many times the applied force. The more work resistance, the stronger the impact until the maximum torque on "frozen nuts" is reached as indicated in the chart above. The power originates in its spring loaded handle through linkage to a rotary hammer. Impacts result from either continuous movement of the handle in one direction or by reciprocating it as a ratchet wrench.

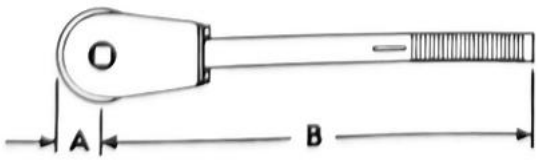
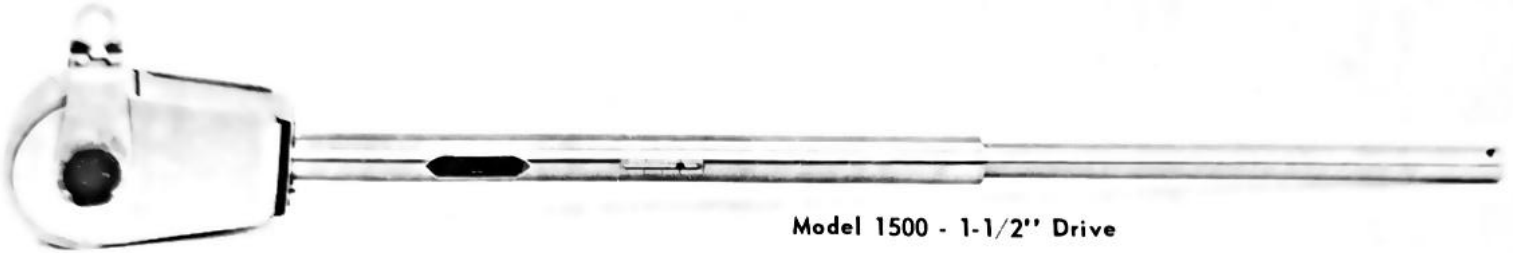


Fig. 1



Model 1500 - 1-1/2" Drive

Model 1250 - 1-1/4" Drive

Model 1000 - 1" Drive

Model 750 - 3/4" Drive

Model 625 - 5/8" Drive

Fig. 2

CHAPTER II

OPERATING INSTRUCTIONS

Section 1 - Service upon receipt of material

Prior to placing the SWENCH wrench in service, perform lubrication as indicated in appropriate lubrication chart. (Appendix #1). No other servicing is required unless wrench appears to be damaged.

Section 2 - Controls

The SWENCH wrenches (except the Model 500) contain one control located in the handle of the wrench. This control allows four power settings except on the model 625 which contains only 3 settings. The power level per impact is indicated by and is proportional to the position number opposite the set screw in the slot on the side of the tool handle.

Section 3 - Operating Instructions

a. Principles of Operation

The SWENCH manual impact wrench is used like an ordinary ratchet wrench to loosen or tighten threaded fasteners using a standard square drive impact socket to connect the wrench to the fastener. The nutrunner is provided on all models except #1250 and #1500 for ease in spinning loosened nuts on or off without disengaging the SWENCH.

With the SWENCH in use, when the nut engaged offers sufficient resistance to rotation, each 30 degree movement of the handle causes a torsional impact to be delivered to the socket and nut at a torque value many times greater than the force applied to the handle. Movement of the handle is continued either in the same direction or by reciprocating it like a ratchet wrench until enough impacts have been delivered to do the particular job of loosening or tightening.

b. Adjusting the SWENCH

The power delivered by each impact can be adjusted by turning the set screw head, recessed in the end of the handle, with the set screw wrench provided for this purpose.

The power level per impact is indicated by, and is proportional to, the position number of the indicator in the slotted side of the tool handle. That is, the power output increases as the setting number is increased. While one power setting can be used to handle a wide range of bolting jobs, it is recommended that the lowest power setting that will do the job be used whenever possible. A power setting over 3 should be used only when this extreme power is really necessary.

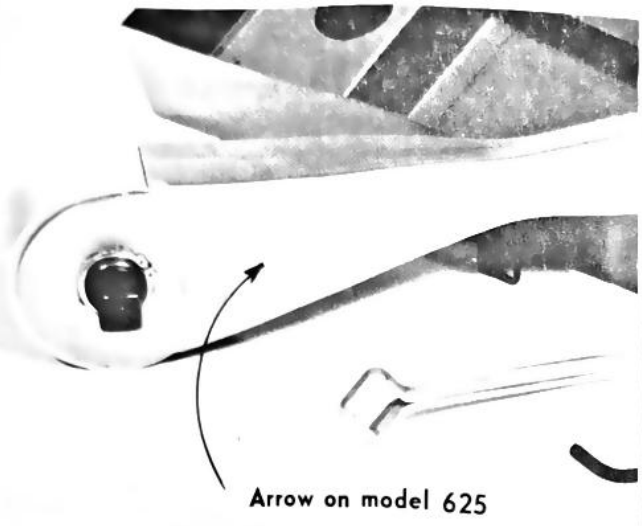


Fig. 3

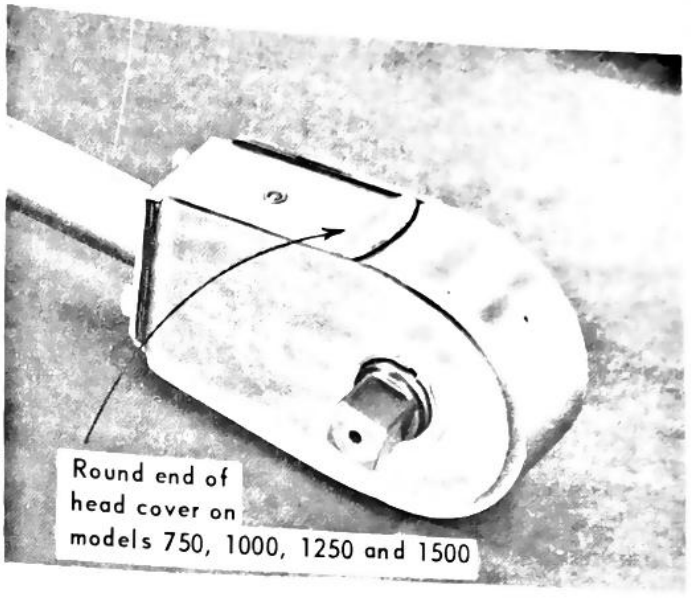


Fig. 4

c. Operation

To operate SWENCH models 500 and 625 for removing a right hand threaded nut, insert square drive on the opposite side of the counter-clockwise arrow into the socket engaging the nut. The arrow pointing to the direction of turn should always be on the side of the SWENCH opposite the one engaged. To operate all other models similarly, insert the SWENCH square drive so that the round end of the SWENCH head cover is to the right. For all models one then pulls the handle in the same manner as an ordinary ratchet wrench until enough impacts are delivered to do the job.

To tighten a right hand thread nut on models 500 and 625, insert the square drive so that the arrow points clockwise on the side opposite the one engaged and again operate the tool like a ratchet wrench. To operate all other models similarly, insert the SWENCH square drive so that the round end of the SWENCH head cover is to the left and again operate the tool like a ratchet wrench. Each impact applied results in additional tightening of the nut, so the total number of impacts used, determines the final tension in the tightened bolt. Short experience with SWENCH will enable the mechanic to consistently duplicate bolt tension with sufficient accuracy for general tightening jobs by noting the bolt size, the amount the socket turns with each impact and by making rough comparative checks with an ordinary hand wrench.

The nutrunner slips over the square drive opposite the engaged side of the SWENCH and is used to spin loosened nuts on or off independently of the movement of the SWENCH. The nutrunner handle is easily spun around while the SWENCH remains stationary.

Two socket retaining pins are provided (except on models 1250 and 1500) for attaching the SWENCH to the impact socket or to SWENCH offsets and extensions. The pins slip in and out easily and are held in place by friction.

For maximum service all accessories such as offsets, adaptors and extensions used in conjunction with SWENCH wrenches must be those specifically designed for SWENCH use as provided by the Marquette Division of Curtiss-Wright Corporation. Likewise square drive sockets used with SWENCH wrenches should be of the impact variety.

d. Precise Tightening

The SWENCH Wrench may be used to tighten nuts and bolts (on a repetitive basis) to within specific torque values with a degree of accuracy unmatched by any other known hand or powered tool, (except precision torque measuring devices). To arrive at the number of impacts for a specified or required torque value, the following procedure is recommended.

(1.) Tighten the nut or bolt to the specified torque value, check with precision torque measuring device.

(2.) Scribe a line down the head of the nut or bolt to adjacent fixed surface.

(3.) With the appropriate size SWENCH Wrench loosen the nut or bolt counting the number of impacts required to render it free from any bind.

Tighten the nut or bolt back up (with the SWENCH) until the scribed line on the head matches the line on the fixed surface. Generally, it takes one more impact to regain the specific torque value than it does to loosen the nut. For instance: If it takes 10 impacts to loosen the nut, it will generally take 11 impacts to regain required torque value.

IMPORTANT: The method used to obtain a torque value must be consistent. Examples: If the wrench is ratcheted back and forth approximately 30^{o} (enough to produce only a single impact) then this method must be used for all future tightening on this particular type of nut or bolt application. If the wrench is ratcheted through an arc that will produce six impacts with each handle swing, then this method should be continued for all tightening on this particular application. Likewise if the SWENCH is ratcheted continuously in a complete circle, then do this consistently as long as the same type of application is involved.

A particular application is defined as nuts and bolts that are identical in shape, size, material and number of threads. The metal being fastened must also be of the same shape, size and material and if the machinery or object being worked upon is a non-rigid or movable item, it must generally have the same degree of rigidity or mobility as it has at the time the required number of impacts are determined. Example: The bolts required to assemble segments of a piece of machinery may require a different number of impacts if the machinery itself is firmly attached to an immovable object as opposed to the machine being unattached to another surface. The degree of impact produced by the SWENCH is dependent upon the amount of resistance encountered. Therefore, anything which directly or indirectly affects the amount of resistance encountered also affects the total number of impacts required to do the fastening job at hand.

(5.) With a precision torque measuring device, check the tightness of the bolt to ascertain if the correct torque was attained.

(6.) Repeat this procedure until precise torque value is attained by adding or omitting impacts.

(7.) Once the number of impacts to obtain a specified torque is ascertained repeat the process three times for assurance.

The SWENCH will repeatedly render a specific torque on any given application once the impact requirement is established. Thereafter the same number of impacts may be used in the same applications provided there have been no changes as defined in the definition of a particular application described above.

CHAPTER III

MAINTENANCE, DISASSEMBLY, REPAIR AND ASSEMBLY INSTRUCTIONS

Section 1 - Special Tools

No elaborate special tools are required for disassembly and assembly procedures. Standard tools required are outlined in Appendix III.

Section 2 - Overhaul Procedure

See appropriate instructions under Appendix III.

Section 3 - Lubrication

See appropriate lubrication chart under Appendix I.

Section 4 - Preventive maintenance services

No periodic lubrication is required on models 500 and 625. For weekly lubrication on other models see Appendix I.

a. Check handle and side plates for cracks weekly. Wrenches with cracks should be turned in for repair.

b. Check rotary hammer (rotor) for burrs and distortion weekly. With fine file smooth out all distorted surfaces.

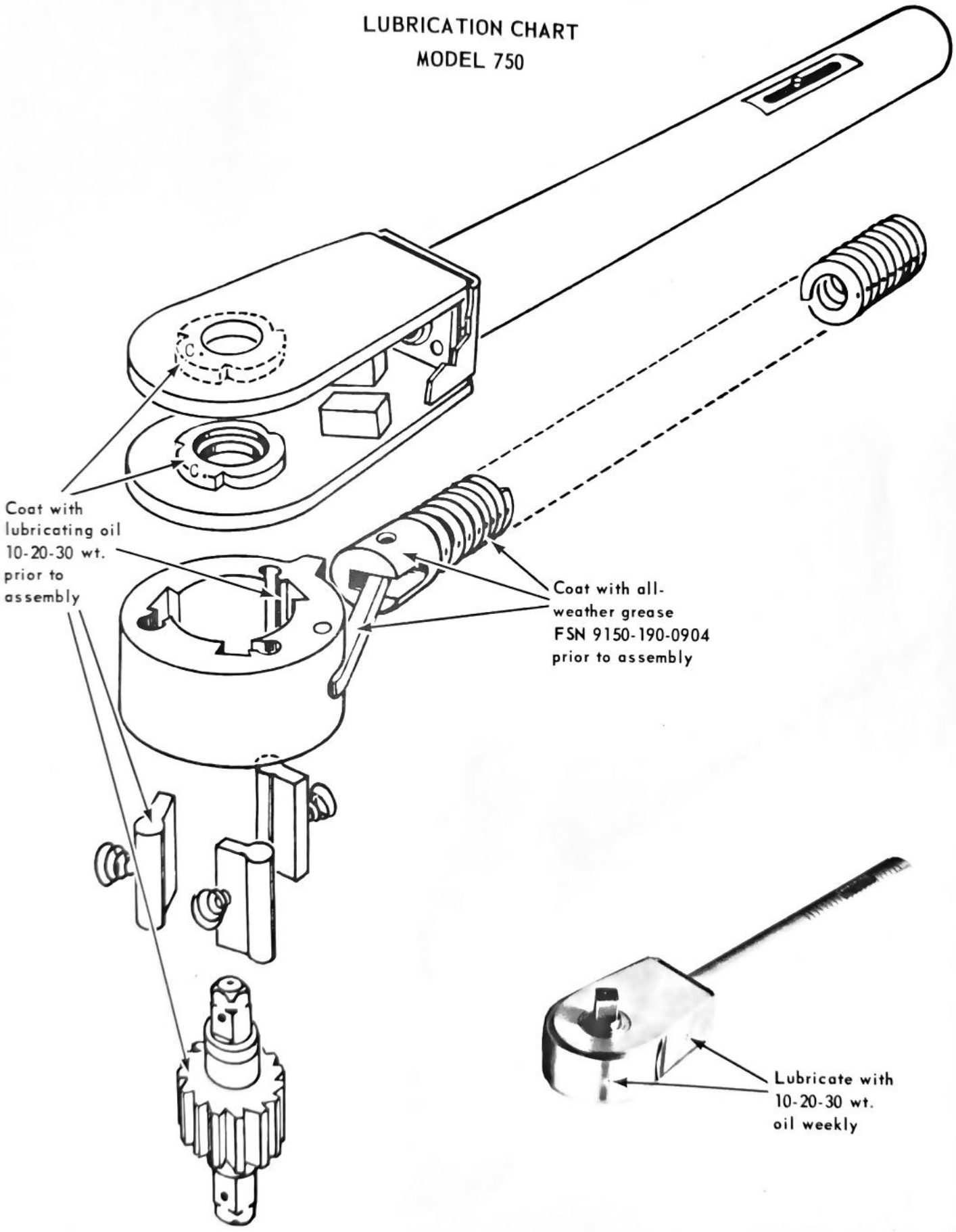
Section 5 - Trouble Shooting

TROUBLE SHOOTING CHART

Symptoms	Probable Troubles	Remedies	Procedures
Wrench fails to develop maximum torque	Lack of Lub.	Oil as per Lub. Chart	See insturctions Appendix I
	Improper spring adjustment	Adjust	See instructions per Chap. II, Sec. 3
	Cross head lacks grease	Disassemble and Lubricate as per Lub. Chart	See instructions Appendix I
	Rotor burr	Remove burrs	See preventive maintenance Chap. III, Sec. 4
Wrench fails to impact No ratchet action	Broken tooth on ratchet	Disassemble and replace ratchet	See Appendix III
	Broken pawl springs	Disassemble and replace pawl springs	See Appendix III

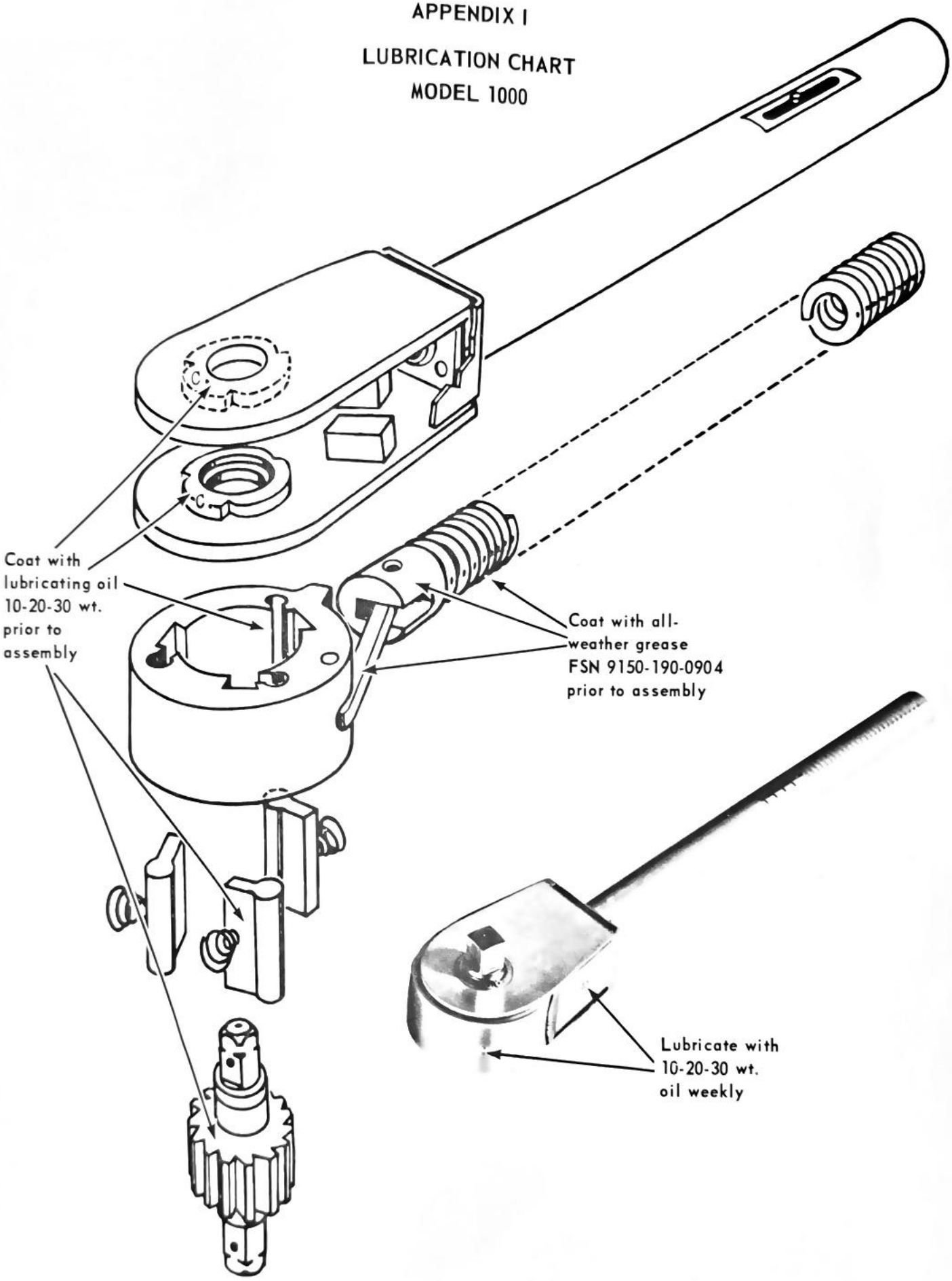
APPENDIX I

LUBRICATION CHART
MODEL 750


Coat with lubricating oil 10-20-30 wt. prior to assembly
Coat with all-weather grease FSN 9150-190-0904 prior to assembly
Lubricate with 10-20-30 wt. oil weekly

APPENDIX I

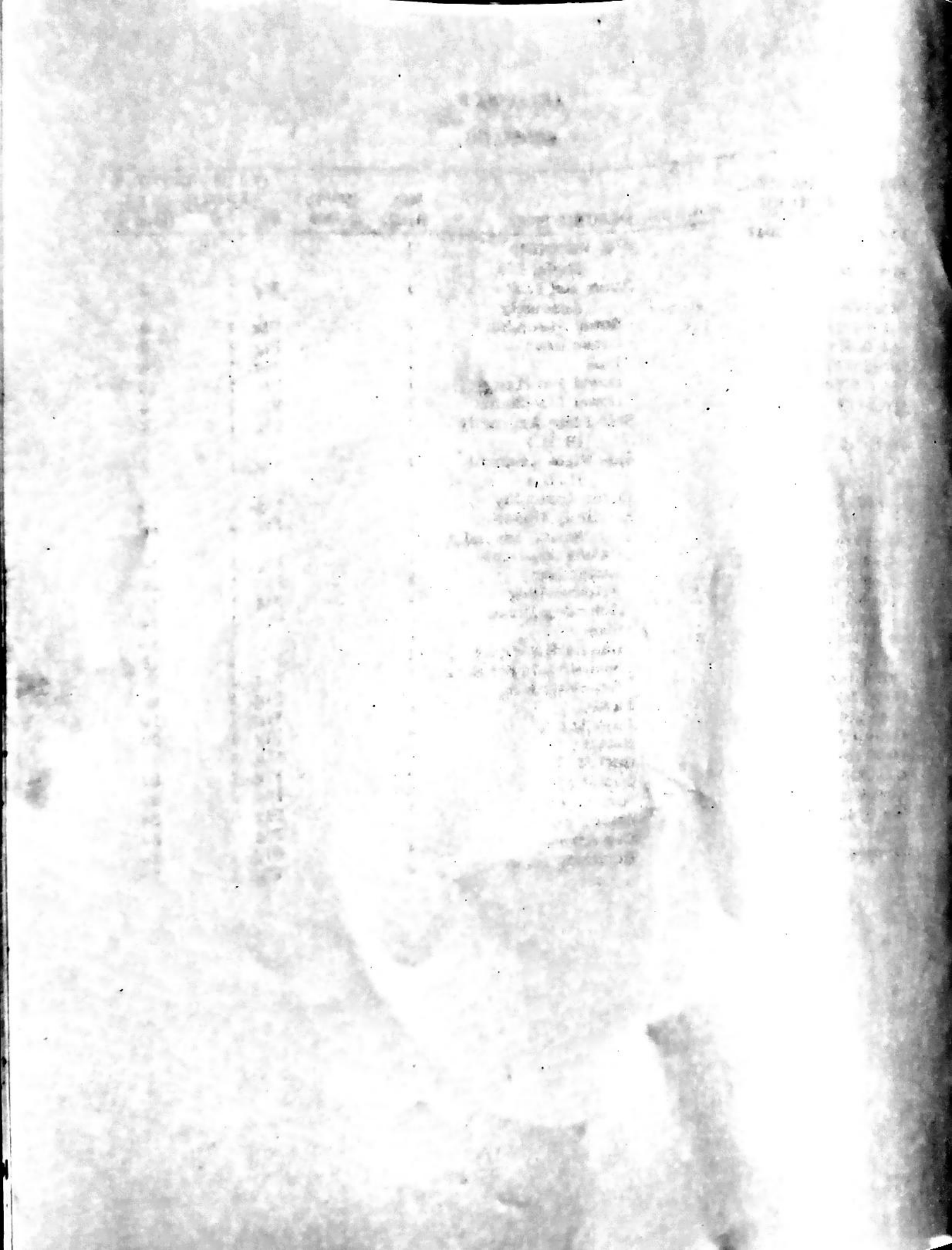
LUBRICATION CHART
MODEL 1000


Coat with lubricating oil 10-20-30 wt. prior to assembly
Coat with all-weather grease FSN 9150-190-0904 prior to assembly
Lubricate with 10-20-30 wt. oil weekly

APPENDIX II

MODEL 750

FEDERAL OR MFG. PART NUMBER	SOURCE	DESCRIPTION	NO. REQ.	INVT. QUAN.	ILLUSTRATIONS (APPENDIX III) Fig. No.	Item No.
FSN 5120-440-8047		3/4" SWENCH Model 750	1			
41-80702		Rotor and Link Assembly	1		Fig. 1	1
41-70702		Rotor Assembly	1		Fig. 1	2
41-00721		Cross Head	1		Fig. 1	3
41-00720		Link	1		Fig. 1	4
91-25311		Dowel Pin (Long)	1		Fig. 1	5
91-25310		Dowel Pin (Short)	1		Fig. 1	6
41-80718		Side Plate Assembly (R.H.)	1		Fig. 1	7
41-80718-1		Side Plate Assembly (L.H.)	1		Fig. 1	8
41-80730		Cover Assembly	1		Fig. 1	9
41-80724		Handle & Adjusting Screw Assembly	1		Fig. 1	10
41-70724		Handle Assembly	1		Fig. 1	11
41-00732		Spring Nut	1		Fig. 1	12
41-00734		Friction Plug	1		Fig. 1	13
41-00736		Adjusting Screw	1		Fig. 1	14
41-00737		Washer	1		Fig. 1	15
41-00741		Handle Slot Cover	1		Fig. 1	16
91-33713		Socket Head Set Screw	1		Fig. 1	17
91-52044		Retaining Ring	1		Fig. 1	18
41-00705		Pawl	3		Fig. 1	19
41-00706		Pawl Spring	3		Fig. 1	20
41-00707		Ratchet	1		Fig. 1	21
41-00726		Gasket	2		Fig. 1	22
41-00713		Locking Plate	2		Fig. 1	23
41-00731		Spring (Long)	1		Fig. 1	24
41-00743		Spring (Short)	1		Fig. 1	25
91-31034		Cap Screw	4		Fig. 1	26
91-52043		Retaining Ring	2		Fig. 1	27



APPENDIX II

MODEL 1000

FEDERAL OR MFG. PART NUMBER	SOURCE	DESCRIPTION	NO. REQ.	INVT. QUAN.	ILLUSTRATIONS (APPENDIX III) Fig. No.	Item No.
FSN 5120-440-8011		1" SWENCH Model 1000	1			
41-81002		Rotor and Link Assembly	1		Fig. 1	1
41-71002		Rotor Assembly	1		Fig. 1	2
41-01021		Cross Head	1		Fig. 1	3
41-01020		Link	1		Fig. 1	4
91-25313		Dowel Pin (Long)	1		Fig. 1	5
91-25312		Dowel Pin (Short)	1		Fig. 1	6
41-81018		Side Plate Assembly (R.H.)	1		Fig. 1	7
41-81018-1		Side Plate Assembly (L.H.)	1		Fig. 1	8
41-81030		Cover Assembly	1		Fig. 1	9
41-81024		Handle and Adjusting Screw Assembly	1		Fig. 1	10
41-71024		Handle Assembly	1		Fig. 1	11
41-01032		Spring Nut	1		Fig. 1	12
41-01034		Friction Plug	1		Fig. 1	13
41-01036		Adjusting Screw	1		Fig. 1	14
41-01037		Washer	1		Fig. 1	15
41-10141		Handle Slot Cover	1		Fig. 1	16
91-33714		Socket Head Set Screw	1		Fig. 1	17
91-52048		Retaining Ring	1		Fig. 1	18
41-01005		Pawl	3		Fig. 1	19
41-00706		Pawl Spring	6		Fig. 1	20
41-01007		Ratchet	1		Fig. 1	21
41-01031		Main Spring	1		Fig. 1	22
41-01013		Locking Plate	2		Fig. 1	23
41-10126		Gasket	2		Fig. 1	24
91-31035		Cap Screw	4		Fig. 1	25
91-34395		Washer	as req'd.		Fig. 1	26
91-52047		Retaining Ring	2		Fig. 1	27

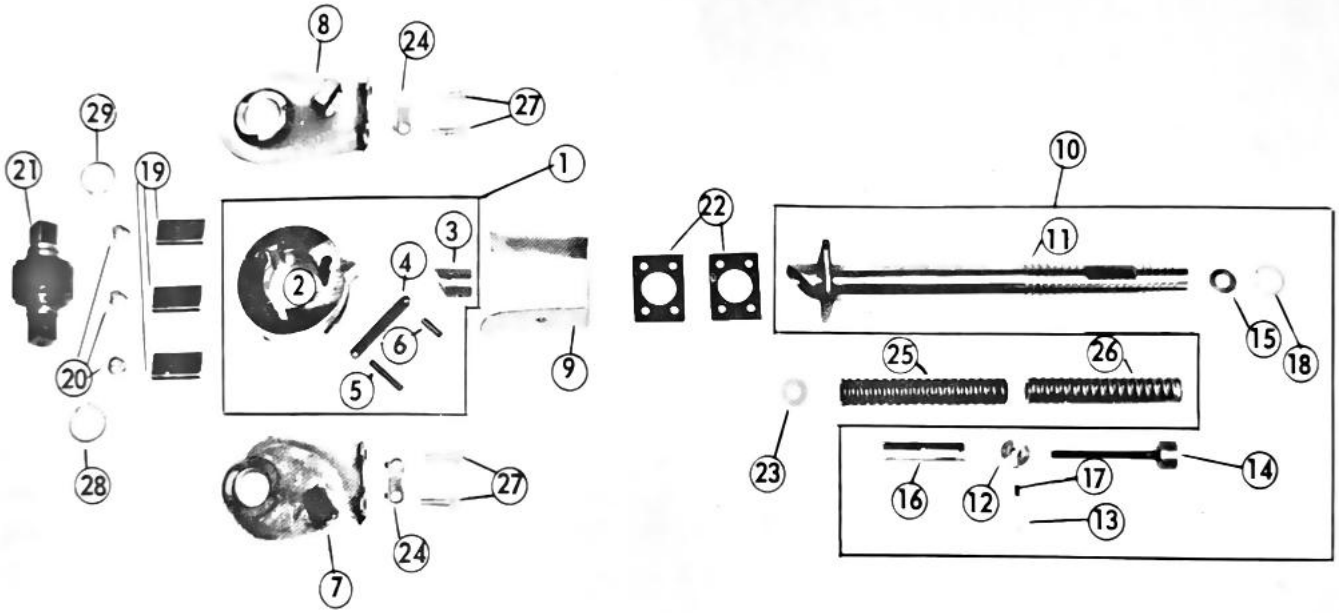
APPENDIX III

MODEL 750 (¾" DRIVE)

Procedures required to overhaul the Model 750 SWENCH. Disassembly and assembly procedures are illustrated in sequence. Inspection procedures with maximum wear tolerances are as indicated.

Tools required:

Mallet - wood or plastic
Internal snap ring pliers
External snap ring pliers
5/16" hex head wrench
3/32" hex head wrench
1/2" hex socket or 1/2" open end wrench



(Fig. 1) **PARTS LIST ILLUSTRATED**

Item	Part Number	Part Name
1	41-80702	Rotor and Link Assembly
2	41-70702	Rotor Assembly
3	41-00721	Cross Head
4	41-00720	Link
5	91-25311	Dowel Pin (Long)
6	91-25310	Dowel Pin (Short)
7	41-80718	Side Plate Assembly (R.H.)
8	41-80718-1	Side Plate Assembly (L.H.)
9	41-80730	Cover Assembly
10	41-80724	Handle & Adjusting Screw Assembly
11	41-70724	Handle Assembly
12	41-00732	Spring Nut
13	41-00734	Friction Plug
14	41-00736	Adjusting Screw
15	41-00737	Washer
16	41-00741	Handle Slot Cover
17	91-33713	Soc. Hd. Set Screw
18	91-52044	Retaining Ring
19	41-00705	Pawl
20	41-00706	Pawl Spring
21	41-00707	Ratchet
22	41-00726	Gasket
23	91-34395	Washer
24	41-00713	Locking Plate
25	41-00731	Spring (Long)
26	41-00743	Spring (Short)
27	91-31034	Cap Screw
28	91-52043	Retaining Ring

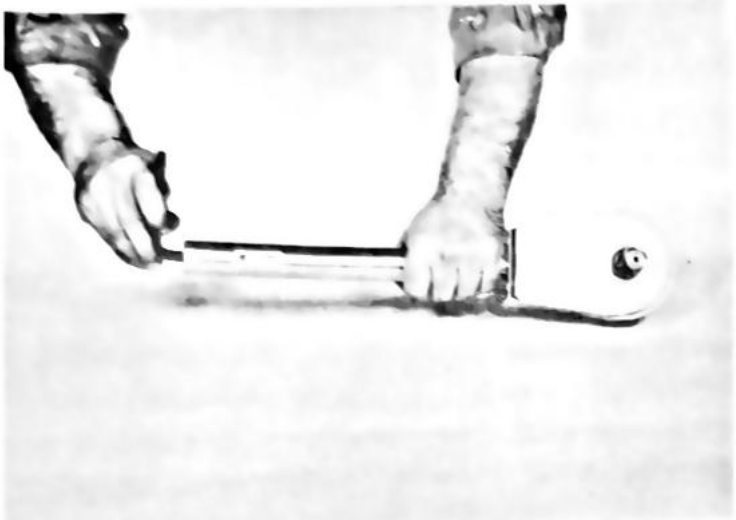


Fig. 2

Fig. 3

a. To disassemble

(1.) (Fig. 2) With 5/16" hex head wrench adjust SWENCH to minimum power setting (#1 or below).

(2.) (Fig. 3) With 1/2" socket or open end wrench remove the 4 bolts at the base of the SWENCH head. If SWENCH now has tab locks, tabs must be flattened first and tab locks discarded after removal of bolts.

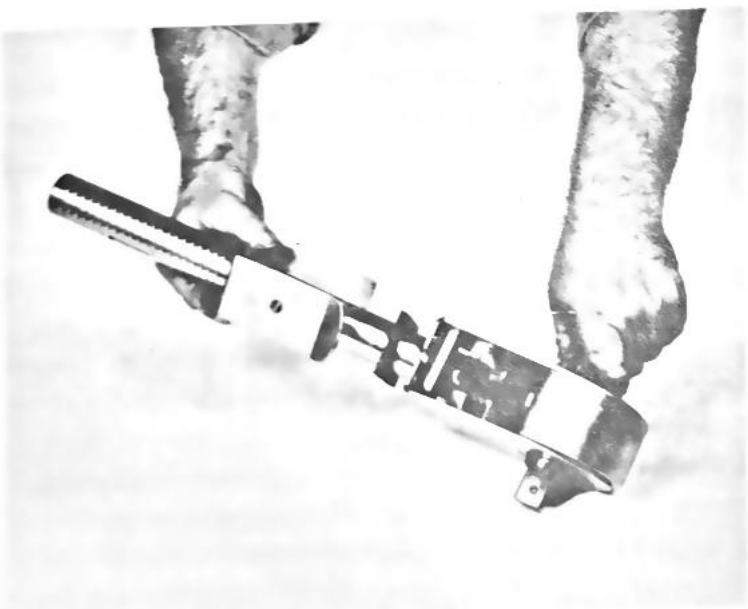


Fig. 4

Fig. 5

(3.) (Fig. 4) Slide head cover and rubber gasket underneath it, over end of handle. Oil cup in handle cover need not be removed unless damaged, but may be tapped out if necessary.

(4.) (Fig. 5) With external snap ring pliers remove snap ring from square drive on each side of SWENCH head.

Fig. 6

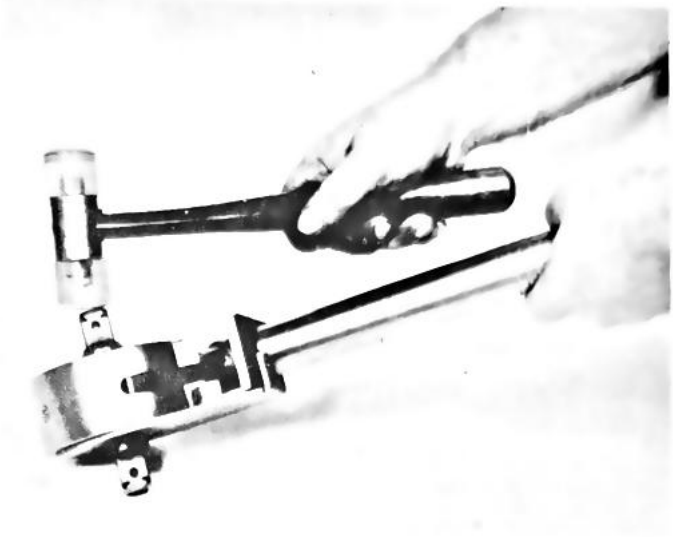


Fig. 7

(5.) (Fig. 6) Lay wrench down so that adjustment indicator is facing you. Remove exposed side plate from head assembly.

(6.) (Fig. 7) Push square drive out of rotor. (Tap lightly with mallet if necessary). Remaining side plate will come off at the same time and rotor, link and cross head assembly will fall out attached to each other by dowel pins. These pins at either end of link may be tapped out with a rod if necessary.

Fig. 8

Fig. 9

(7.) (Fig. 8) Depress pawls into rotor cavities and slide pawls out. Pawl springs will drop out at the same time. Oil cup in rotor need not be removed unless damaged, but may be tapped out with rod if necessary.

(8.) (Fig. 9) Springs will fall from head end of handle. To remove adjusting screw assembly from handle, use 3/32" hex head wrench to remove set screw which appears in indicator slot in handle. There is a friction plug underneath the set screw which may be pushed out if necessary. Remaining rubber gasket on handle need not be removed unless rubber is damaged or worn.

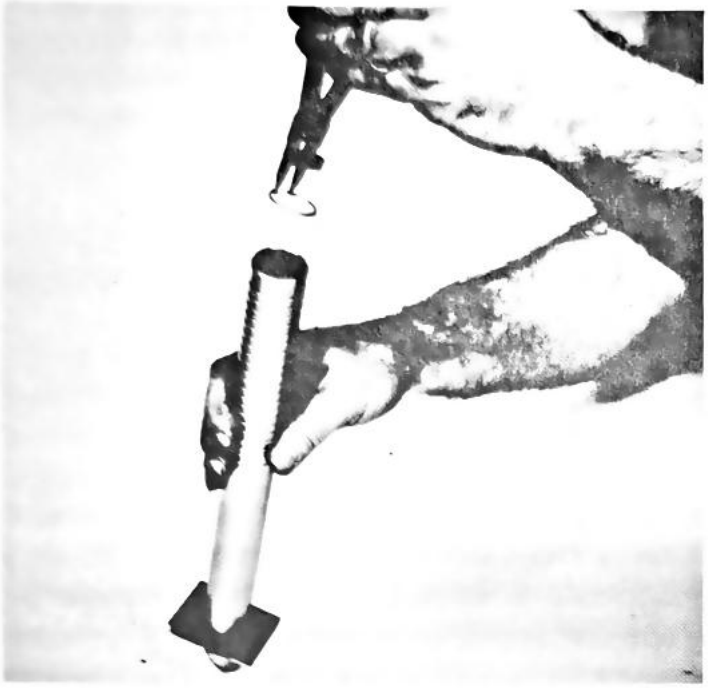


Fig. 10

Fig. 11

(9.) (Fig. 10) With internal snap ring pliers remove internal snap ring from end of handle.

(10.) (Fig. 11) Tip handle toward head end and adjusting screw assembly spring cover and washer will fall out.

(11.) Wash all parts with suitable grease solvent.

b. Inspection and repair procedure

(1.) Parts must be inspected in accordance with good shop practice by experienced personnel. Under strong light, and preferably under magnification, visually inspect all applicable parts for cracks, distortion, burrs, corrosion, damaged threads, nicks, chips, deep scratches, pitting, bent or warped condition and for excessive wear. Excessive wear is defined as any obvious deformation or deterioration of parts which may render the unit inoperative.

(2.) When any doubt exists concerning serviceability of a part as evidenced by (1) above and dimensions given in table on page 5, the deficient part should be replaced. Minor galled surfaces and other irregularities may be repaired by filing so long as the filed portion blends to the original contour.

INSPECT			
PART NAME	PART NUMBER	DIMENSIONS	
		MINIMUM	MAXIMUM
Side Plate Assemblies:	41-80718 & 41-80718-1		
Cam O. D.		2.035	
Cam I. D.			1.135
Handle Springs: Free Length	41-00743	4-7/8"	5"
	41-00731	5-3/8"	5-1/2"
Pawl Springs: Free Length	41-00706	1/2"	
Pawls:	41-00705	.987	
Ratchet: Teeth O. D.	41-00707	1.990	
Shoulder O. D.		1.113	

c. To reassemble

(1.) Coat spring and inside of handle with a heavy all-weather type grease. Coat cams, ratchet, pawls and rotor wtih 10-20-30 weight lubricating oil.

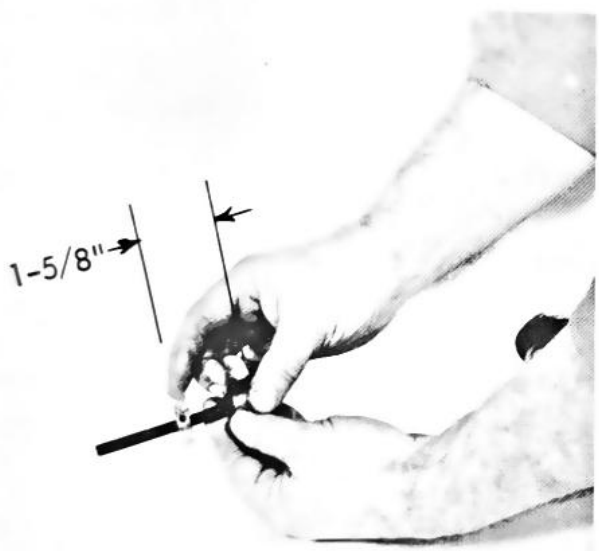


Fig. 12

Fig. 13

(2.) (Fig. 12) Locate spring nut on adjusting screw so that distance from center of spring nut set screw hole to outer edge of adjusting screw head is 1-5/8". (This is important as it permits power setting to rest in #1 position with springs relaxed). Make sure friction plug is in bottom of set screw hole. Place a dab of grease on spring nut to aid in retaining cover in place when sliding assembly into handle.

(3.) (Fig. 13) Place brass indicator cover over spring nut with hole in cover over set screw hole in spring nut. The end of cover should be parallel with adjusting screw.

Fig. 14

Fig. 15

(4.) (Fig. 14) Slide adjusting screw assembly into square cut-off end of handle (with head of adjusting screw toward handle end) and replace hex head adjusting screw in spring nut through indicator slot in handle. Be certain, that hex head adjusting screw goes through hole in brass indicator cover and into spring nut. (If burrs on internal snap ring slot prevent insertion, file off burrs).

(5.) (Fig. 15) Replace plain washer and snap ring in handle end.

Fig. 16

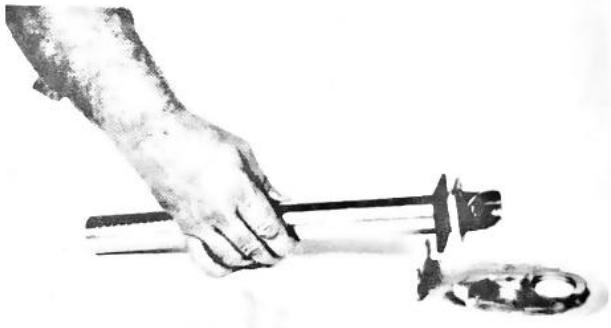


Fig. 17

(6.) (Fig. 16) If springs are shorter than 5" and 5-1/2" respectively but not less than 4-7/8" and 5-3/8" add washers of the same diameter as springs to fill out the remaining length. Insert washers in tapered cut-off end of handle, then insert springs. Be sure that chamfered end of one spring is at tapered cut-off end of handle. (Either spring may be inserted first).

(7.) (Fig. 17) Be sure first rubber gasket is put on from handle end until it stops at handle flange. Take side plate that has stop block on your right when lugs are toward you and lay the outside face down on solid surface. Place handle assembly with indicator slot up, in groove in side plate flange. (When properly placed, cut-off angle on handle will be on same plane as the stop block welded on inside of side plate and rubber gasket will be between handle flange and side plate lugs).

Fig. 18

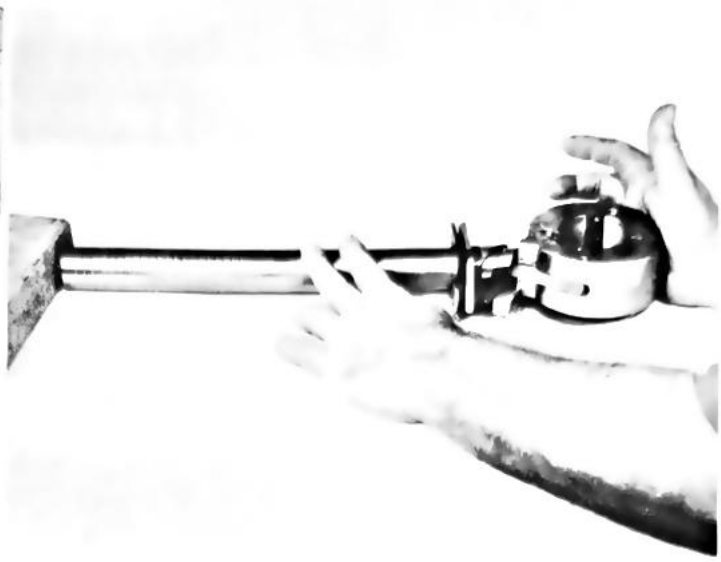


Fig. 19

(8.) (Fig. 18) If dowel pins that connect link to cross head and rotor have been removed, replace these to reconnect. Small dowel goes in cross head. Insert cross head into tapered cut-off end of handle. Tapered side of cross head should go in same direction as taper on handle. Link will lay on side plate stop block.

(9.) (Fig. 19) Place grip end of handle against a firm surface. Take rotor engaged with link and push on rotor toward handle until link depresses spring sufficiently to allow rotor to snap into position over side plate cams. Rotor stop should come to rest against end of stop block on side plate.

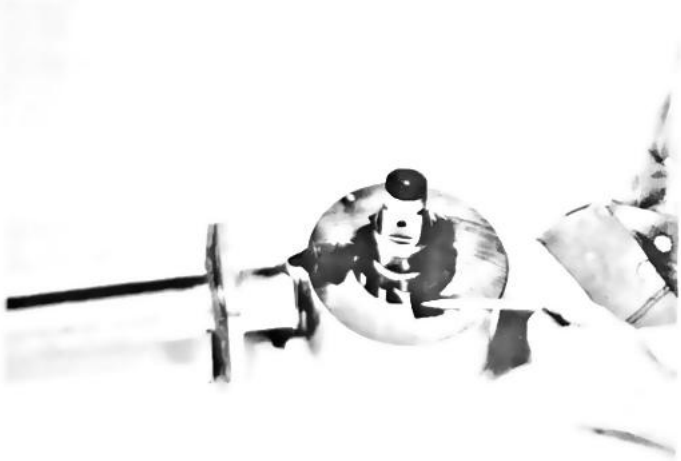


Fig. 20

Fig. 21

(10.) (Fig. 20) Insert ratchet in rotor with square face of ratchet teeth placed so that they will catch on square ends of pawls.

(11.) (Fig. 21) Turn wrench over and replace snap ring exposed through replaced side plate. Be sure snap ring is seated in square drive grooves.

Fig. 22

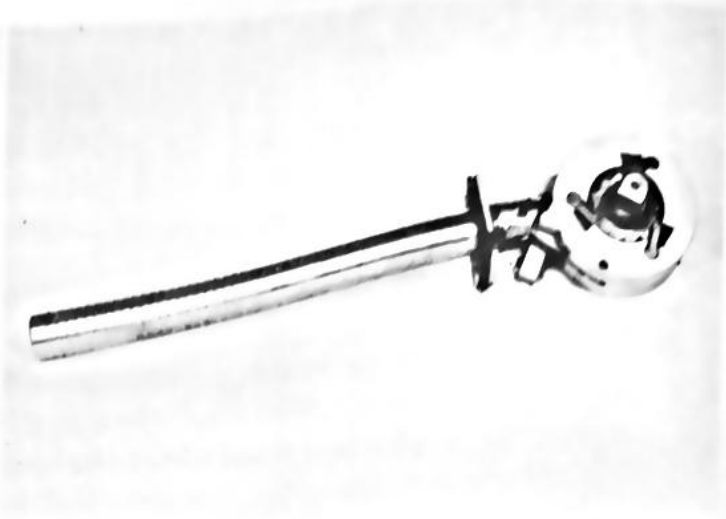


Fig. 23

(12.) (Fig. 22) With pawl partly inserted and pressed firmly against the square end of a ratchet tooth, insert pawl spring between pawl and rotor. Large end of spring should be against rotor. Now slide pawl completely into rotor and be sure that spring is located equidistant between the two flat top and bottom rotor surfaces.

(13.) (Fig. 23) Repeat for 2 other pawls. When you are through, the SWENCH should be as shown.

Fig. 24

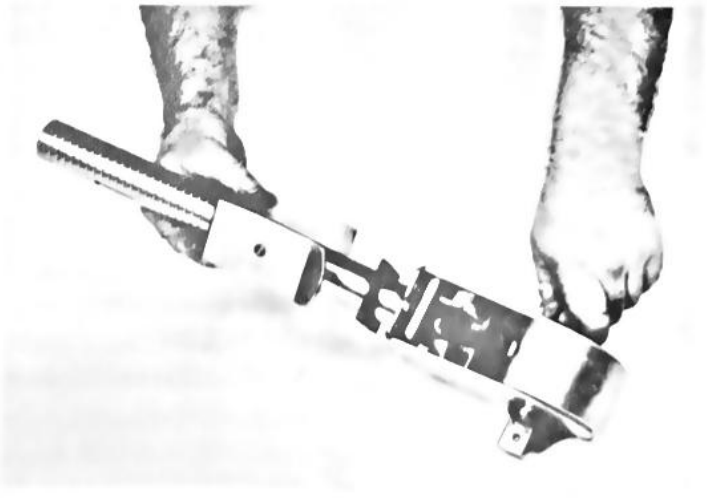


Fig. 25

(14.) (Fig. 24) Replace remaining side plate and replace snap ring on exposed square drive. Be sure snap ring is in place in groove on square drive.

(15.) (Fig. 25) Place second rubber washer over handle and then slide head cover over handle. Be sure that there is an oil cup on this cover and that the oil cup is on the same side of the SWENCH head as the rotor link. (Oil cup is inserted in cover by tapping and speed nut is pressed on from under side).

Fig. 26

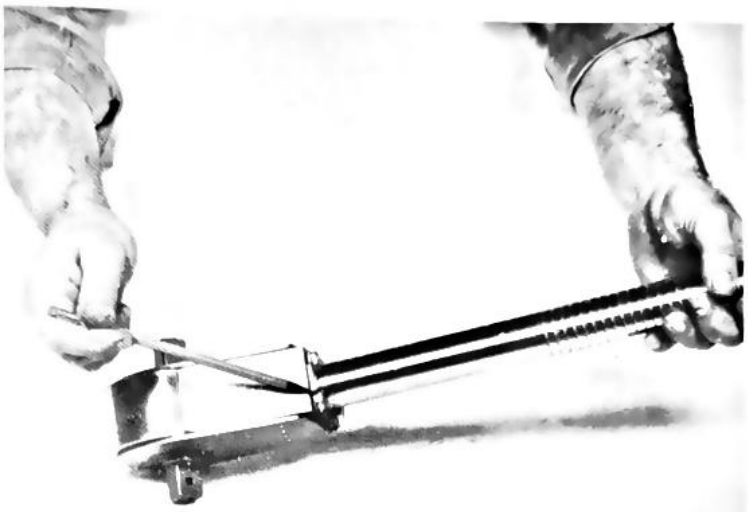


Fig. 27

(16.) (Fig. 26) Replace the four bolts in cover through 2 new lock tabs and tighten with socket or open end wrench until rubber washer under cover commences to compress. Do not overtighten. (Do not use lock washers found on some Swenches or previously used lock tabs).

(17.) (Fig. 27) Bend over lock tabs to keep bolts from loosening. If oil cup in rotor has been removed, be sure this is replaced by tapping into rotor.

(18.) Adjust power setting and impact wrench to test for proper impacting.

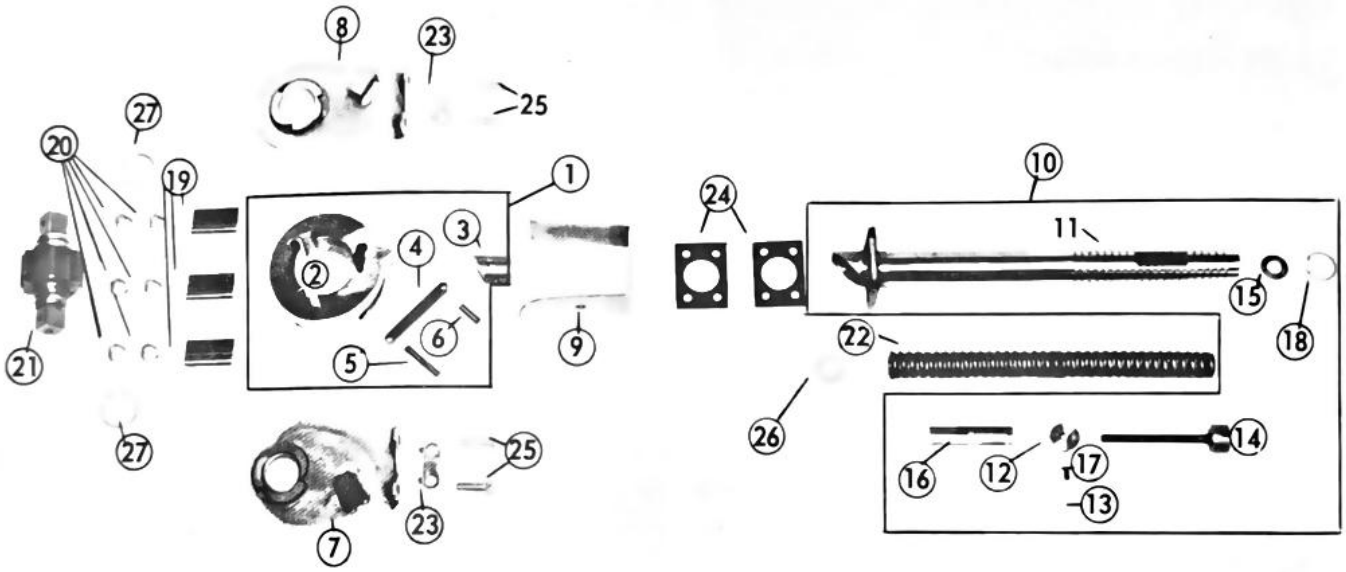
APPENDIX III

MODEL 1000 (1" DRIVE)

Procedures required to overhaul the Model 1000 SWENCH. Disassembly and assembly procedures are illustrated in sequence. Inspection procedures with maximum tolerances are as indicated.

Tools required:

Internal snap ring pliers
External snap ring pliers
9/16" hex socket or 9/16" open end wrench
3/8" hex head wrench
1/8" hex head wrench
Mallet - wood or plastic
Smooth or fine file



(Fig. 1) **PARTS LIST ILLUSTRATED**

Item	Part Number	Part Name
1	41-81002	Rotor and Link Assembly
2	41-71002	Rotor Assembly
3	41-01021	Cross Head
4	41-01020	Link
5	91-25313	Dowel Pin (Long)
6	91-25312	Dowel Pin (Short)
7	41-81018	Side Plate Assembly (R.H.)
8	41-81018-1	Side Plate Assembly (L.H.)
9	41-81030	Cover Assembly
10	41-81024	Handle & Adjusting Screw Assembly
11	41-71024	Handle Assembly
12	41-01032	Spring Nut
13	41-01034	Friction Plug
14	41-01036	Adjusting Screw
15	41-01037	Washer
16	41-01041	Handle Slot Cover
17	91-33714	Socket Head Set Screw
18	91-52048	Retaining Ring
19	41-01005	Pawl
20	41-00706	Pawl Spring
21	41-01007	Ratchet
22	41-01031	Main Spring
23	41-01013	Locking Plate
24	41-01026	Gasket
25	91-31035	Cap Screw
26	91-34395	Washer
27	91-52047	Retaining Ring

Fig. 6

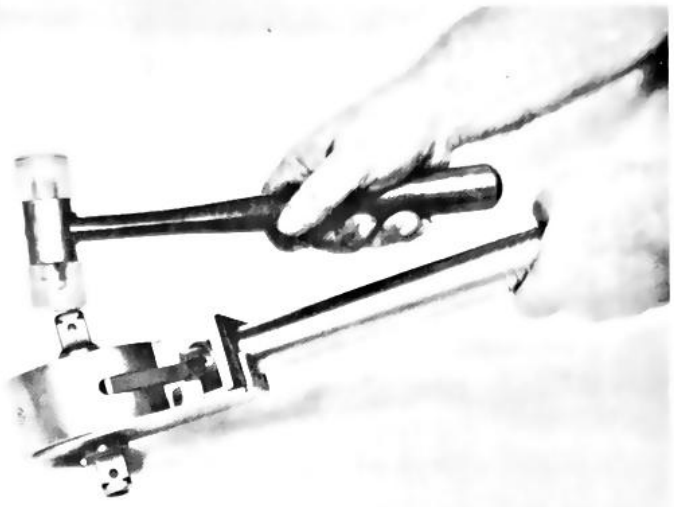


Fig. 7

(5.) (Fig. 6) Lay wrench down so that adjustment indicator is facing you. Remove exposed side plate from head assembly.

(6.) (Fig. 7) Push square drive out of rotor. (Tap lightly with mallet if necessary). Remaining side plate will come off at the same time and rotor, link and cross head assembly will fall out attached to each other by dowel pins. These pins at either end of link may be tapped out with a rod if necessary.

Fig. 8

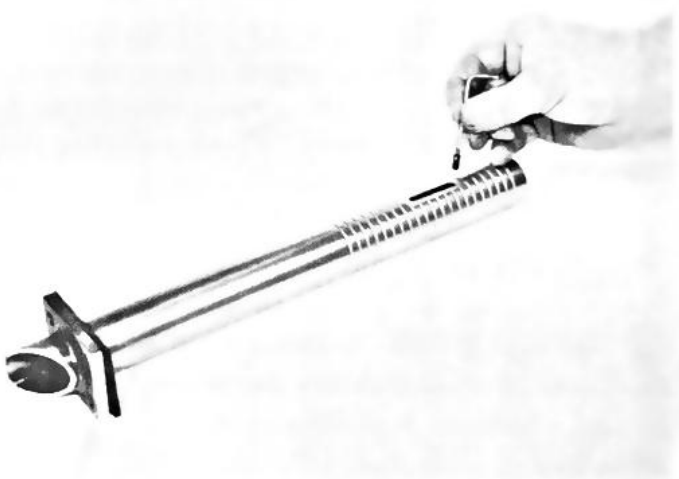


Fig. 9

(7.) (Fig. 8) Depress pawls into rotor cavities and slide pawls out. Pawl springs will drop out at the same time. Oil cup in rotor, need not be removed unless damaged, but may be tapped out with rod if necessary.

(8.) (Fig. 9) Springs will fall from head end of handle. To remove adjusting screw assembly from handle, use 1/8" Allen wrench to remove set screw which appears in indicator slot in handle. There is a friction plug underneath the set screw which may be pushed out if necessary. Remaining rubber gasket on handle need not be removed unless rubber is damaged or worn.

Fig. 10

Fig. 11

(9.) (Fig. 10) With internal snap ring pliers remove internal snap ring from end of handle and also remove plain washer found under snap ring.

(10.) (Fig. 11) Tip handle toward head end and adjusting screw assembly spring cover and washer will fall out.

(11.) Wash all parts with a suitable grease solvent.

b. Inspection and repair procedure

(1.) Parts must be inspected in accordance with good shop practice by experienced personnel. Under strong light, and preferably under magnification, visually inspect all applicable parts for cracks, distortion, burrs, corrosion, damaged threads, nicks, chips, deep scratches, pitting, bent or warped condition and for excessive wear. Excessive wear is defined as any obvious deformation or deterioration of parts which may render the unit inoperative.

(2.) When any doubt exists concerning serviceability of a part as evidenced by (1) above and dimensions given in table on page 5, the deficient part should be replaced. Minor galled surfaces and other irregularities may be repaired by filing so long as the filed portion blends to the original contour.

INSPECT		DIMENSIONS	
PART NAME	PART NUMBER	MINIMUM	MAXIMUM
Side Plate Assemblies:	41-81018 & 41-81018-1		
Cam O. D.		2.549	
Cam I. D.			1.518
Handle Spring: Free Length	41-01031	12"	12-1/4"
Cross Head: Dia.	41-01021	1.250	
Pawl Springs: Free Length	41-00706	1/2"	
Pawls:	41-01005	1.245	
Ratchet: Teeth O. D.	41-01007	2.484	
Shoulder O. D.		1.484	

c. To reassemble

(1.) Coat spring and inside of handle with a heavy all-weather type grease. Coat cams, ratchet, pawls and rotor with 10-20-30 weight lubricating oil.

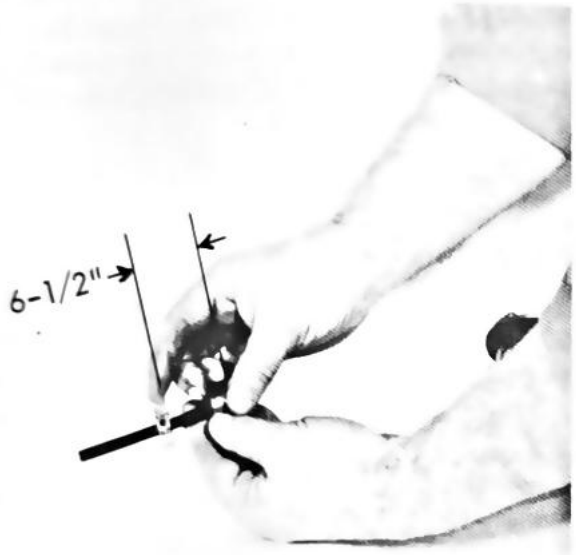


Fig. 12

Fig. 13

(2.) (Fig. 12) Locate spring nut on adjusting screw so that distance from the center of spring nut, set screw hole to outer edge of adjusting screw head is 6-1/2". (This is important as it permits power setting to rest in #1 position with springs relaxed). Make sure friction plug is in bottom of set screw hole. Place a dab of grease on spring nut to aid in retaining cover in place when sliding assembly into handle.

(3.) (Fig. 13) Place brass indicator cover over spring nut with hole in cover over set screw hole in spring nut. The end of cover should be parallel with adjusting screw.

Fig. 14

Fig. 15

(4.) (Fig. 14) Slide adjusting screw assembly into square cut-off end of handle (with head of adjusting screw toward handle end) and replace hex head adjusting screw in spring nut through indicator slot in handle. Be certain, that hex head adjusting screw goes through hole in brass indicator cover and into spring nut. (If burrs on internal snap ring slot prevent insertion, file off burrs).

(5.) (Fig. 15) Replace plain washer and snap ring in handle end.

Fig. 16

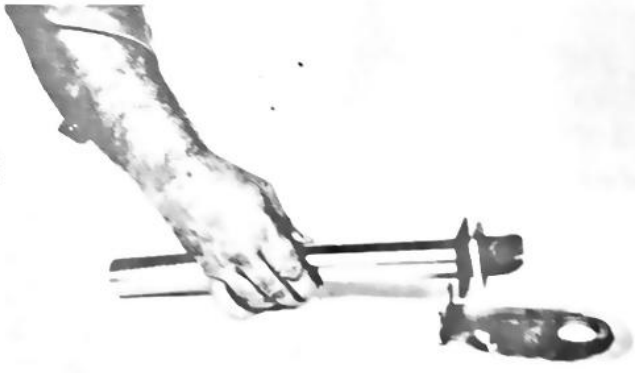


Fig. 17

(6.) (Fig. 16) If spring is shorter than 12-1/4" but not less than 12", add washers of the same diameter as the spring to fill out the remaining length. Insert washers in tapered cut-off end of handle, then insert spring. Be sure that chamfered end of spring is at tapered cut-off end of handle.

(7.) (Fig. 17) Be sure first rubber gasket is put on from handle end until it stops at handle flange. Take side plate that has stop block on your right when lugs are toward you and lay the outside face down on solid surface. Place handle assembly with indicator slot up, in groove in side plate flange. (When properly placed, cut-off angle on handle will be on same plane as the stop block welded on inside of side plate and rubber gasket will be between handle flange and side plate lugs).

Fig. 18

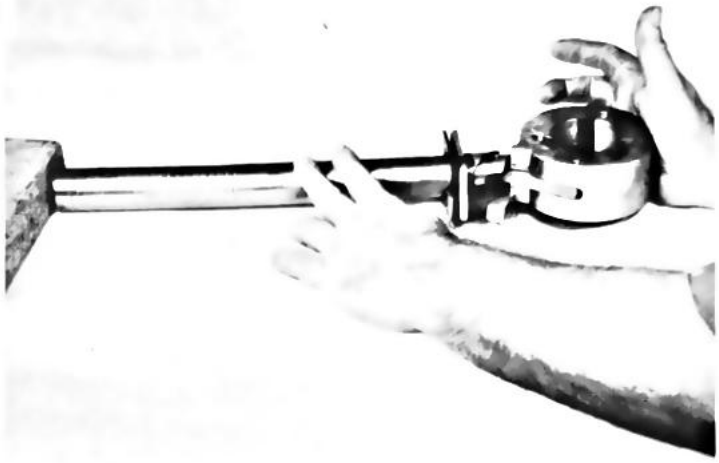


Fig. 19

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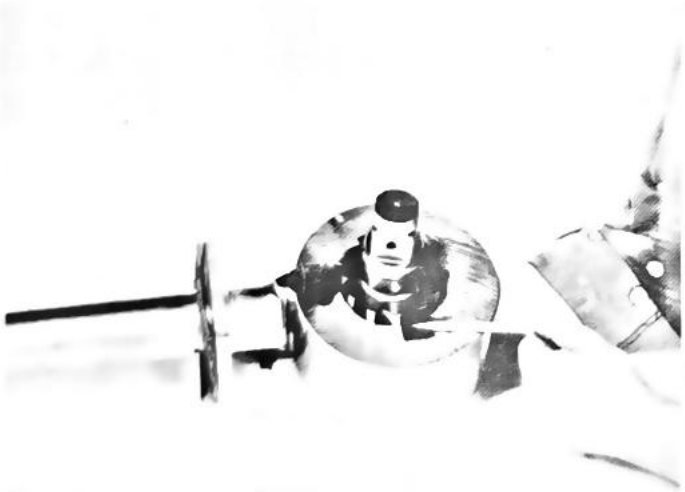

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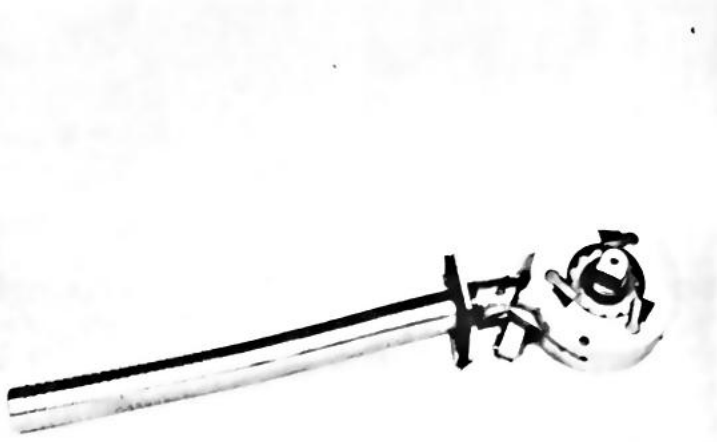


Fig. 23

(12.) (Fig. 22) With pawl partly inserted and pressed firmly against the square end of a ratchet tooth, insert one pawl spring between pawl and rotor. Large end of spring should be against rotor. Now slide pawl 2/3 of way into rotor and add a second spring in same manner as the first. Push pawl all the way and adjust springs so that they are approximately equidistant from each other and from the 2 ends of the pawl.

(13.) (Fig. 23) Repeat for 2 other pawls. When you are through, the SWENCH should be as shown.

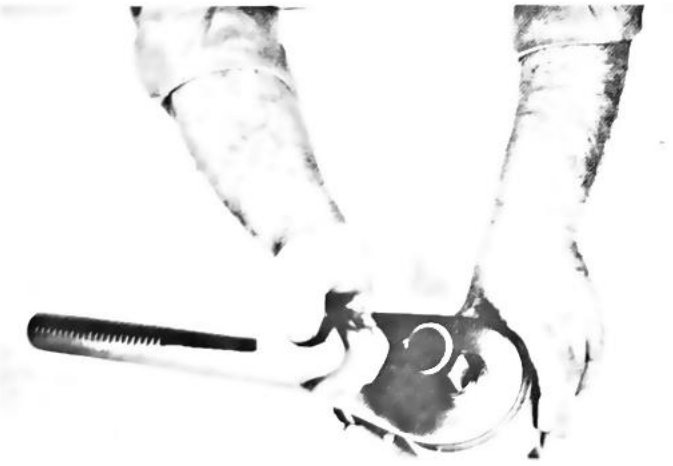


Fig. 24

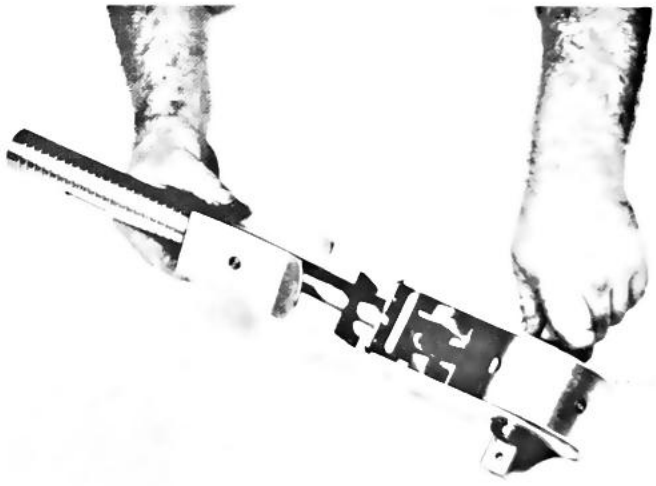
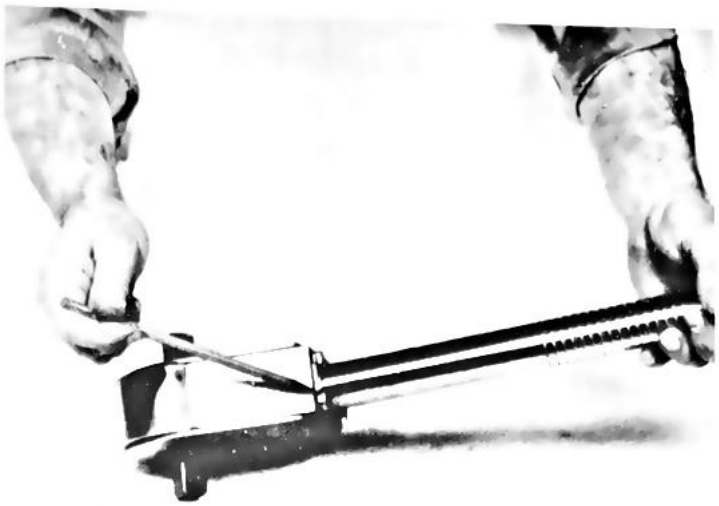


Fig. 25

(14.) (Fig. 24) Replace remaining side plate and replace snap ring on exposed square drive. Be sure snap ring is in place in groove on square drive.

(15.) (Fig. 25) Place second rubber washer over handle and then slide head cover over handle. Be sure that there is an oil cup on this cover and that the oil cup is on the same side of the SWENCH head as the rotor link. (Oil cup is inserted in cover by tapping and speed nut is pressed on from under side).

Fig. 26



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